

INTERNATIONAL
STANDARD

ISO/IEC
21122-2

First edition
2019-07

**Information technology — JPEG XS
low-latency lightweight image coding
system —**

**Part 2:
Profiles and buffer models**



Reference number
ISO/IEC 21122-2:2019(E)

© ISO/IEC 2019



COPYRIGHT PROTECTED DOCUMENT

© ISO/IEC 2019

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Fax: +41 22 749 09 47
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Contents

Page

Foreword	iv
Introduction	v
1 Scope	1
2 Normative references	1
3 Terms, definitions, symbols and abbreviated terms	1
3.1 Terms and definitions.....	1
3.2 Conformance language.....	4
3.3 Operators.....	4
3.3.1 Arithmetic operators.....	4
3.3.2 Logical operators.....	4
3.3.3 Relational operators.....	4
3.3.4 Precedence order of operators.....	4
3.3.5 Mathematical functions.....	5
4 Specifications	5
4.1 Symbols.....	5
4.2 Abbreviated terms.....	7
4.3 General provisions.....	7
5 Buffer model	8
5.1 General system block diagram.....	8
5.2 Influencing variables on the required buffer sizes.....	9
5.3 Role of the buffer model.....	9
Annex A (normative) Profiles, levels and sublevels	10
Annex B (normative) Packet-based JPEG XS decoder model	22
Annex C (normative) Packet-based constant bit rate buffer model	28
Annex D (informative) Encoder model, latency bounds and codestream conformance properties for the packet-based constant bit rate buffer model	35
Annex E (informative) JPEG XS latency analysis	40
Bibliography	47

Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO and IEC shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents) or the IEC list of patent declarations received (see <http://patents.iec.ch>).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see www.iso.org/iso/foreword.html.

This document was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 29, *Coding of audio, picture, multimedia and hypermedia information*.

A list of all parts in the ISO/IEC 21122 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

ISO/IEC 21122-1 (JPEG XS) specifies a single syntax designed to serve a wide range of applications, bit rates, resolutions, qualities, and services. Its main target applications are video transport over video links and IP networks, real-time video storage, video memory buffer, omni-directional video capture system, head-mounted displays for virtual or augmented reality and sensor compression for the automotive industry. These applications have different requirements in terms of complexity, latency and compression efficiency. Even within a given application field, different requirements are usually identified depending on the targeted use case.

Considering the impracticality of implementing the full syntax of ISO/IEC 21122-1, and in order to meet the requirements of the different target applications while safeguarding as much as possible the interoperability enabled by the common syntax defined in ISO/IEC 21122-1, a limited number of subsets of this syntax are stipulated by means of “profiles”, “levels”, and “sublevels”.

The coding tools specified in ISO/IEC 21122-1 allow encoder and decoder implementations to limit the end-to-end latency to a fraction of the frame size. To ensure this property, this document specifies a buffer model, consisting of a decoder model and a transmission channel model.

Information technology — JPEG XS low-latency lightweight image coding system —

Part 2: Profiles and buffer models

1 Scope

This document defines a limited number of subsets of the syntax specified in ISO/IEC 21122-1 and a buffer model to ensure interoperability between implementations in the presence of a latency constraint.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO/IEC 21122-1, *JPEG XS low-latency lightweight image coding system — Part 1: Core coding system*